CLAIMS

The listing of current claims is provided below.

1. (Withdrawn) A method for fabrication of a light emitting device on substrate, the light emitting device having a wafer with multiple epitaxial layers and a first ohmic contact layer on the epitaxial layers remote from the substrate; the method including:

(a) applying to the ohmic first contact layer a seed layer of a thermally conductive metal;

(b) electroplating a relatively thick layer of the thermally conductive metal on the seed layer; and

(c) removing the substrate.

2. (Withdrawn) A method as claimed in claim 1, wherein the first ohmic contact layer is coated with an adhesion layer prior to application of the seed layer.

3. (Withdrawn) A method as claimed in claim 1, wherein the seed layer is patterned with photoresist patterns before the electroplating step (b).

4. (Withdrawn) A method as claimed in claim 3, wherein the electroplating of the relatively thick layer is between the photoresist patterns.

5. (Withdrawn) A method as claimed in claim 1, wherein between steps (b) and (c) there is performed the additional step of annealing the wafer to improve adhesion.

6. (Withdrawn) A method as claimed in claim 3 or, wherein the photoresist patterns are of a height of at least 50 micrometers, a thickness in the range of 3 to 500 micrometers, and a spacing of 300 micrometers.

7-8. (Cancelled)

9. (Withdrawn) A method as claimed in claim 1, wherein the seed layer is electroplated in step (b) without patterning, patterning being performed subsequently.

10. (Withdrawn) A method as claimed in claim 9, wherein patterning is by photoresist patterning and then wet etching, or by laser beam micro-machining of the relatively thick layer.

11. (Cancelled)

12. (Withdrawn) A method as claimed in claim 3, wherein the relatively thick layer is of a height no greater than the photoresist height, or is electroplated to a height greater than the photoresist and is subsequently thinned.

13. (Cancelled)

14. (Withdrawn) A method as claimed in claim 12, wherein thinning is by polishing.

15. (Withdrawn) A method as claimed in claim 1, wherein after step (c) there is

included an extra step of forming on a second surface of the epitaxial layers a second ohmic contact layer, the second ohmic contact layer being selected from the group consisting of: opaque, transparent, and semi-transparent.

16. (Withdrawn) A method as claimed in claim 15, wherein the second ohmic contact layer is one of blank and patterned, wherein bonding pads are formed on the second ohmic contact layer.

17. (Cancelled)

18. (Withdrawn) A method as claimed in claim 1, wherein after step (c) ohmic contact formation and subsequent process steps are carried out, the subsequent process steps including deposition of wire bond pads.

19. (Withdrawn) A method as claimed in claim 18, wherein the exposed epitaxial layer is cleaned and etched before the second ohmic contact layer is deposited.

20. (Withdrawn) A method as claimed in claim 15, wherein the second ohmic contact layer does not cover the whole area of the second surface of the epitaxial layers.

21. (Withdrawn) A method as claimed in claim 15, wherein after forming the second ohmic contact layer there is included testing of the light emitting devices on the wafer, and separating the wafer into individual devices.

22. (Cancelled)

23. (Withdrawn) A method as claimed in claim 1, wherein the light emitting devices are fabricated without one or more selected from the group consisting of: lapping, polishing and dicing.

24. (Withdrawn) A method as claimed in claim 1, wherein the first ohmic contact layers are on p-type layers of the epitaxial layers.

25. (Withdrawn) A method as claimed in claim 15, wherein the second ohmic contact layer is formed on n-type layers of the expitaxial layers.

26. (Withdrawn) A method as claimed in claim 1, wherein after step (c), dielectric films are deposited on the epitaxial layers and openings are cut in the dielectric films and second ohmic contact layers and bond pads deposited on the epitaxial layers.

27. (Withdrawn) A method as claimed in claim 1, wherein after step (c), electroplating of a thermally conductive metal on the epitaxial layers is performed.

28. (Withdrawn) A method as claimed in claim 1, wherein the thermally conductive metal comprises copper and the epitaxial layers comprise multiple GaN-related layers.

29. (Currently Amended) A light emitting diode fabricated by ~~the~~ a method ~~of claim 1~~ for fabrication of the light emitting diode on a substrate, the light emitting diode having a

wafer with multiple epitaxial layers and a first ohmic contact layer on the epitaxial layers remote from the substrate; the method including:

(a) applying to the ohmic first contact layer a seed layer of a thermally conductive metal;

(b) electroplating a relatively thick layer of the thermally conductive metal on the seed layer; and

(c) removing the substrate.

30. (Currently Amended) A laser diode fabricated by a method for fabrication of the laser diode on a substrate, the laser diode having a wafer with multiple epitaxial layers and a first ohmic contact layer on the epitaxial layers remote from the substrate, the method including:

(a) applying to the ohmic first contact layer a seed layer of a thermally conductive metal;

(b) electroplating a relatively thick layer of the thermally conductive metal on the seed layer; and

(c) removing the substrate~~the method of claim 1~~.

31. (Original) A light emitting device comprising epitaxial layers, a first ohmic contact layer on a first surface of the epitaxial layers, a relatively thick layer of a thermally conductive metal on the first ohmic contact layer, and a second ohmic contact layer on a second surface of the epitaxial layers; the relatively thick layer being applied by electroplating.

32. (Original) A light emitting device as claimed in claim 31, wherein there is an adhesive layer on the first ohmic contact layer between the first ohmic contact layer and the relatively thick layer.

33. (Original) A light emitting device as claimed in claim 32, wherein there is a seed layer of the thermally conductive metal between the adhesive layer and the relatively thick layer.

34. (Previously Presented) A light emitting device as claimed in claim 31, wherein the relatively thick layer is at least 50 micrometers thick.

35. (Previously Presented) A light emitting device as claimed in claim 31, wherein the second ohmic contact layer is a thin layer in the range of from 3 to 500 nanometers.

36. (Previously Presented) A light emitting device as claimed in claim 31, wherein the second ohmic contact layer is selected from the group consisting of: opaque, transparent, and semi-transparent, and includes bonding pads.

37. (Cancelled)

38. (Previously Presented) A light emitting device as claimed in claim 31, wherein the thermally conductive metal is copper and the epitaxial layers comprise multiple GaN-related epitaxial layers.

39. (Previously Presented) A light emitting device as claimed claim 31, wherein the light emitting device is selected from the group consisting of: a light emitting diode, and a laser diode.

40. (Previously Presented) A light emitting device as claimed claim 31, wherein the first ohmic contact layer, at its interface with the epitaxial layers, is a mirror.

41. (Original) A light emitting device comprising epitaxial layers, a first ohmic contact layer on a first surface of the epitaxial layers, an adhesive layer on the first ohmic contact layer, a seed layer of a thermally conductive metal on the adhesive layer, and a relatively thick layer of the thermally conductive metal on seed layer; the first ohmic contact layer, at its interface with the epitaxial layers, is a mirror.

42. (Original) A light emitting device as claimed in claim 41, wherein the relatively thick layer is one or more selected from the group consisting of: a heat sink, an electrical connector, and a mechanical support.

43. (Previously Presented) A light emitting device as claimed in claim 41, further comprising a second ohmic contact layer on a second surface of the epitaxial layers, the second ohmic contact layer being a thin layer in the range of from 3 to 500 nanometers.

44. (Previously Presented) A light emitting device as claimed in claim 41, wherein the second ohmic contact layer comprises bonding pads and is selected from the group consisting of: opaque, transparent, and semi-transparent.

45. (Previously Presented) A light emitting device as claimed claim 41, wherein the thermally conductive metal comprises copper, and the epitaxial layers comprise GaN-related layers.

46. (Previously Presented) A light emitting device as claimed in claim 41, wherein the light emitting device is one of: a light emitting diode and a laser diode.

47. (Previously Presented) A method of fabrication of a light emitting device, the method including:

(a) on a substrate with a wafer comprising multiple GaN-related epitaxial layers, forming a first ohmic contact layer on a first surface of the wafer;

(b) removing the substrate from the wafer; and

(c) forming a second ohmic contact layer on a second surface of the wafer, the second ohmic contact layer having bonding pads formed thereon.

48. (Previously Presented) A method as claimed in claim 47, wherein the second ohmic contact layer is for light emission, and is selected from the group consisting of: opaque, transparent, and semi-transparent, the second ohmic contact layer being one of: blank, and patterned.

49. (Cancelled)

50. (Currently Amended) A light emitting device fabricated by a method for fabrication of the light emitting device on a substrate, the light emitting device having a

wafer with multiple epitaxial layers and a first ohmic contact layer on the epitaxial layers remote from the substrate; the method including:

(a) applying to the ohmic first contact layer a seed layer of a thermally conductive metal;

(b) electroplating a relatively thick layer of the thermally conductive metal on the seed layer; and

(c) removing the substrate~~the method of claim 47~~.

51. (Original) A light emitting device as claimed in claim 50, wherein the light emitting device is selected from the group consisting of: a light emitting diode, and a laser diode.